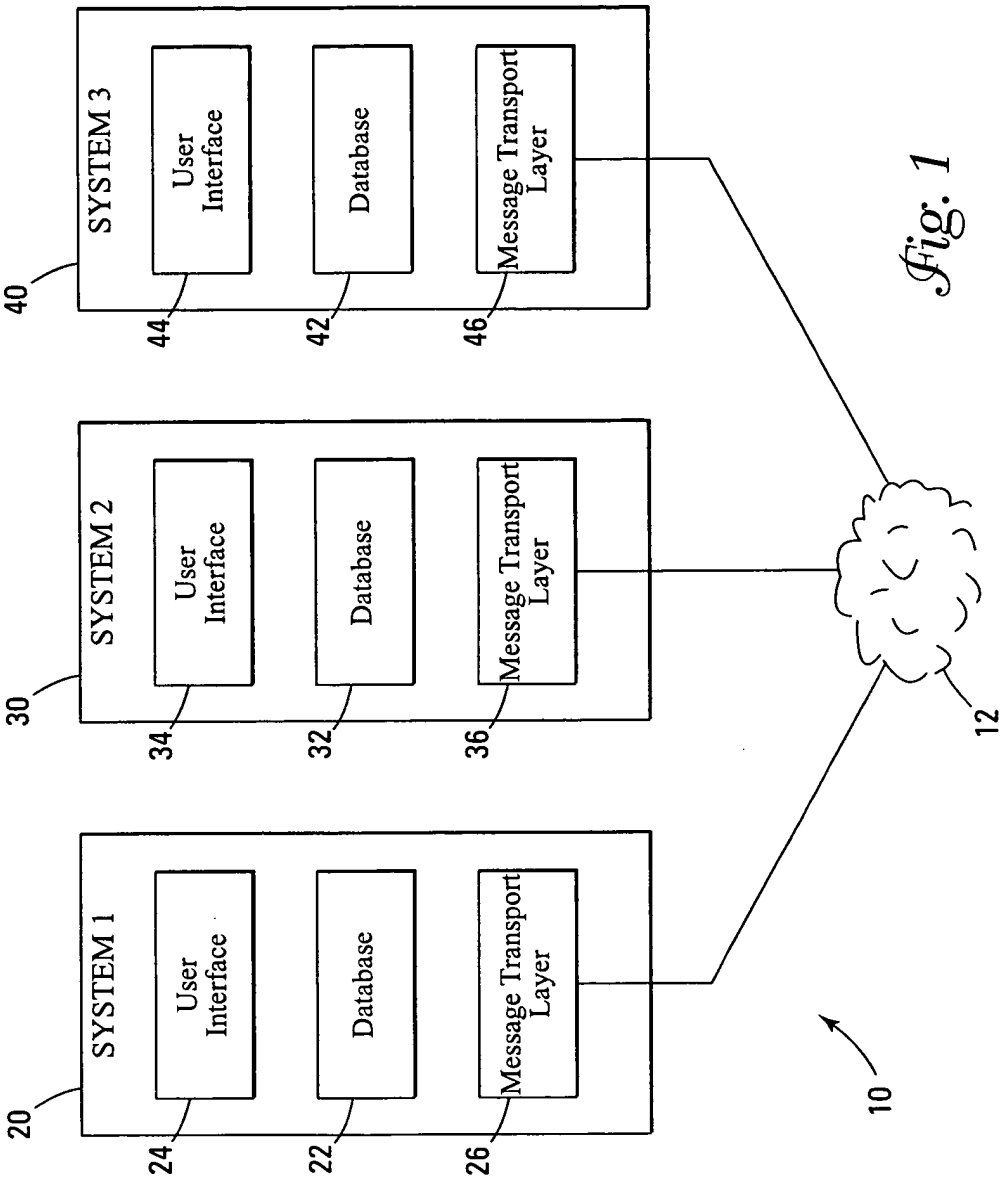

SYSTEM 3
User Interface
Database
Message Transport Layer
40
44
42
46
SYSTEM 2
User Interface
Database
Message Transport Layer
30
34
32
36
SYSTEM 1
User Interface
Database
Message Transport Layer
20
24
22
26
12
10

Fig. 1

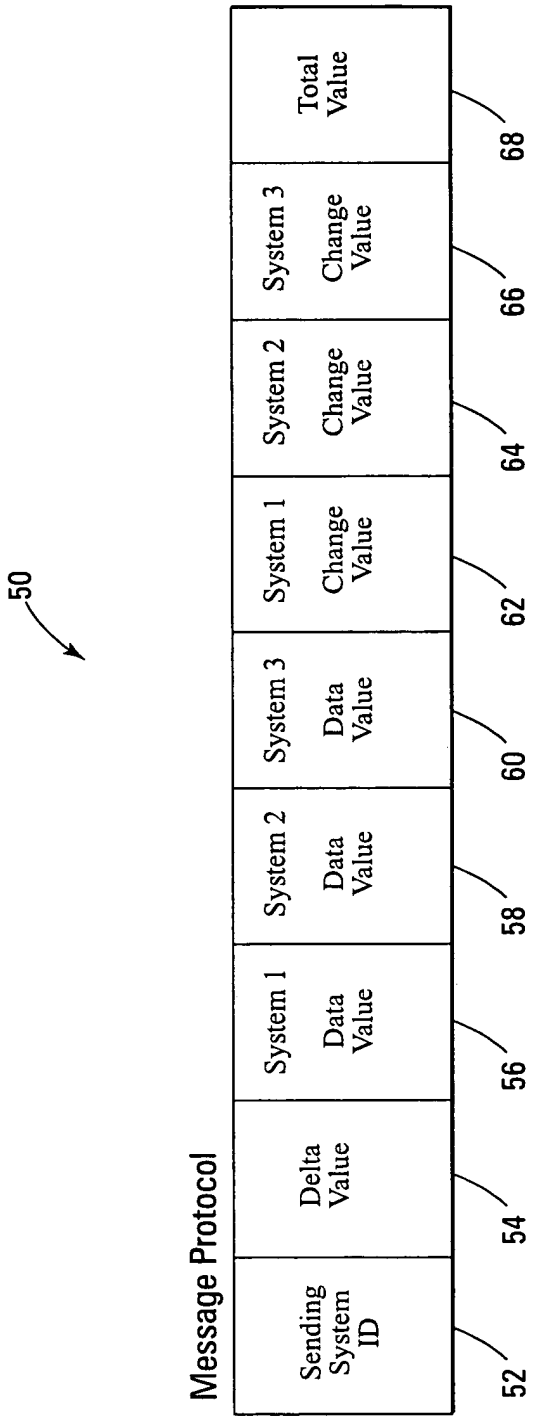

50
Message Protocol
Sending System ID
52
Delta Value
54
System 1 Data Value
56
System 2 Data Value
58
System 3 Data Value
60
System 1 Change Value
62
System 2 Change Value
64
System 3 Change Value
66
Total Value
68

Fig. 2

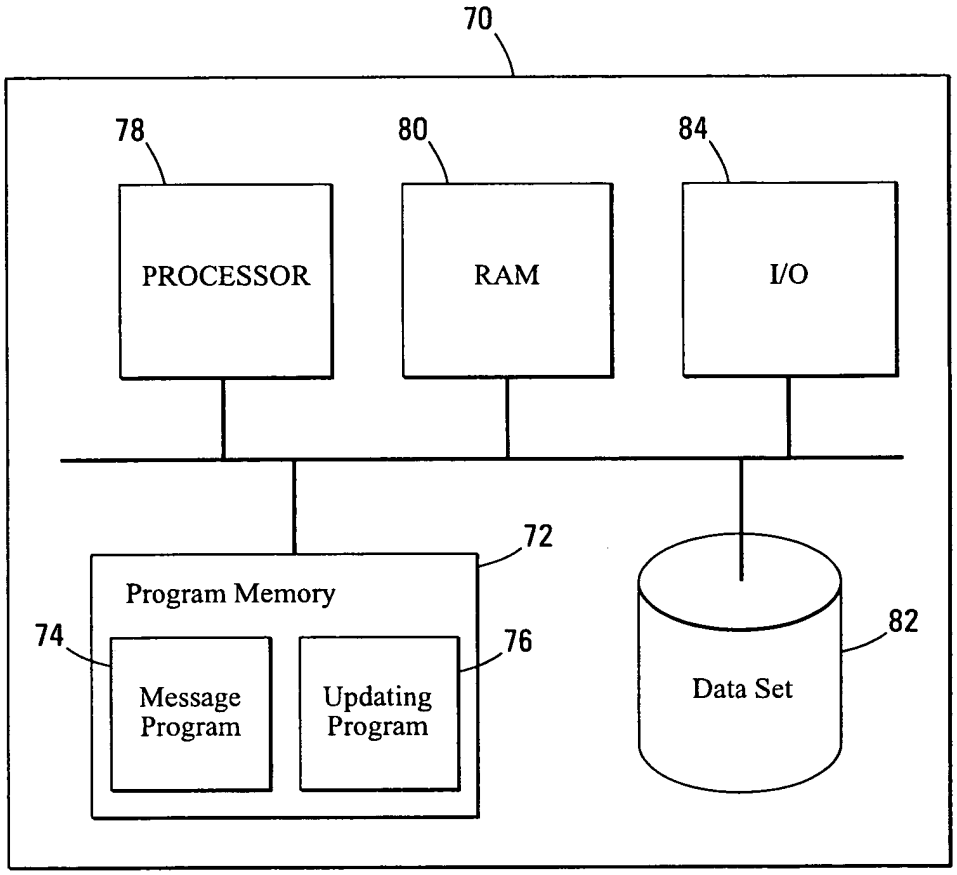

70
78
80
84
PROCESSOR
RAM
I/O
72
Program Memory
74
76
Message Program
Updating Program
82
Data Set

Fig. 3

4/5

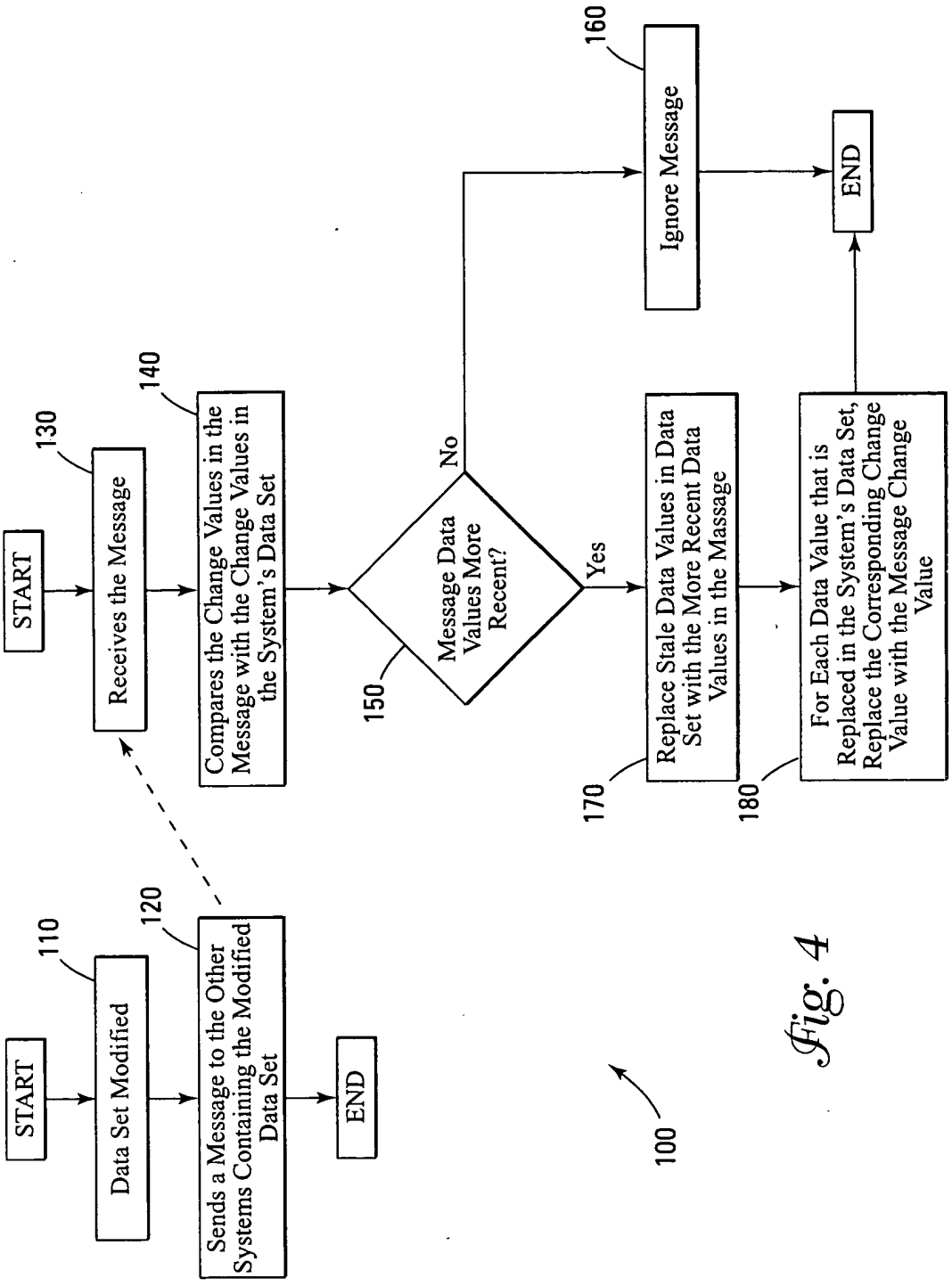
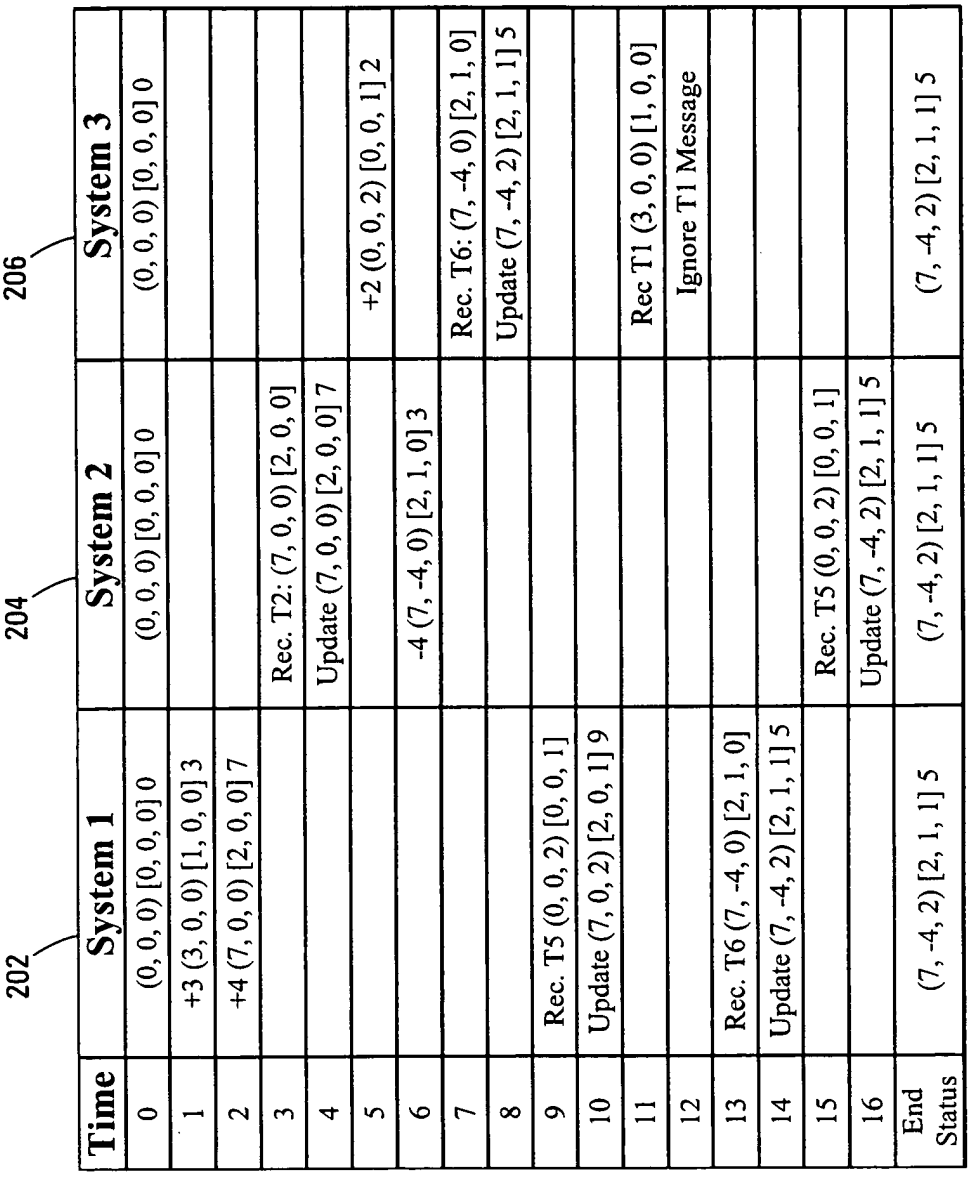

START
Data Set Modified
110
Sends a Message to the Other Systems Containing the Modified Data Set
120
END
START
Receives the Message
130
Compares the Change Values in the Message with the Change Values in the System's Data Set
140
Message Data Values More Recent?
150
No
Ignore Message
160
END
Yes
Replace Stale Data Values in Data Set with the More Recent Data Values in the Massage
170
For Each Data Value that is Replaced in the System's Data Set, Replace the Corresponding Change Value with the Message Change Value
180
100

Fig. 4



Time	System 1	System 2	System 3
0	(0, 0, 0) [0, 0, 0] 0	(0, 0, 0) [0, 0, 0] 0	(0, 0, 0) [0, 0, 0] 0
1	+3 (3, 0, 0) [1, 0, 0] 3		
2	+4 (7, 0, 0) [2, 0, 0] 7		
3		Rec. T2: (7, 0, 0) [2, 0, 0]	
4		Update (7, 0, 0) [2, 0, 0] 7	
5			+2 (0, 0, 2) [0, 0, 1] 2
6		-4 (7, -4, 0) [2, 1, 0] 3	
7			Rec. T6: (7, -4, 0) [2, 1, 0]
8			Update (7, -4, 2) [2, 1, 1] 5
9	Rec. T5 (0, 0, 2) [0, 0, 1]		
10	Update (7, 0, 2) [2, 0, 1] 9		
11			Rec T1 (3, 0, 0) [1, 0, 0]
12			Ignore T1 Message
13	Rec. T6 (7, -4, 0) [2, 1, 0]		
14	Update (7, -4, 2) [2, 1, 1] 5		
15		Rec. T5 (0, 0, 2) [0, 0, 1]	
16		Update (7, -4, 2) [2, 1, 1] 5	
End Status	(7, -4, 2) [2, 1, 1] 5	(7, -4, 2) [2, 1, 1] 5	(7, -4, 2) [2, 1, 1] 5

Fig. 5